INCH-POUND

MIL-C-71186(AR)
31 January 1994

MILITARY SPECIFICATION

CARBINE, 5.56MM: M4A1

This Specification is approved for use by the US Army Armament Munitions and Chemical Command and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements, examinations and tests for a 5.56mm lightweight, air-cooled, gas operated, magazine-fed carbine designed for either full automatic or semi-automatic fire (see 6.1).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards and handbooks. The following specifications, standards and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

MILITARY

MIL-P-116	-	Preservation, Methods of
MIL-C-372	-	Cleaning Compound, Solvent
MIL-W-13855	-	Weapons: Small Arms and Aircraft Armament Subsystems, General Specification for
MIL-I-45607	-	Inspection Equipment, Acquisition, Maintenance and Disposition of

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document, should be addressed to: Commander, U.S. Army ARDEC, ATTN: SMCAR-BAC-S, Picatinny Arsenal, New Jersey 07806-5000 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 1005

MIL-L-46000	-	Lubricating Oil, Semi-Fluid (Automatic Weapons)
MIL-C-46936	-	Cartridge, 5.56mm, Test, High Pressure, M197
MIL-W-63150	-	Weapons and Support Material, Standard Quality Assurance Provisions for
MIL-L-63460	-	Lubricant, Cleaner and Preservative for Weapons and Weapon Systems
MIL-C-63989	-	Cartridge, 5.56mm, Ball M855
MIL-A-70625	-	Automated Acceptance Inspection Equipment for Non-Electronic Components, Design, Testing and Approval of

STANDARDS

MILITARY

MIL-STD-109	-	Quality Assurance Terms and Definitions
MIL-STD-1949	-	Inspection, Magnetic Particle
MIL-STD-45662	-	Calibration System Requirements
MS16562	-	Pin ,Spring, Tubular, Slotted
MS16626	-	Ring, Retaining, External, Inverted (Tapered Section Type)
MS16632	-	Ring, Retaining, External, Crescent (Reduced Section Type)
MS19060	-	Ball, Bearing, Ferrous, Corrosion Resisting Steel
MS35335	-	Washer, Lock, Flat-external Tooth
MS39086	-	Pin ,Spring, Tubular, Coiled, Heavy Duty

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from DODSSP - Standardization Documents Order Desk, 700 Robbins Avenue, Bldg. 4D, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings and publications. The following other Government documents, drawings and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues shall be those cited in the solicitation.

DRAWINGS (see 6.9)

U.S. ARMY ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER (ARDEC)

PRODUCT DRAWINGS

9342868	-	Cartridge, 5.56MM, Ball; M855
12972700	-	Carbine, 5.56MM: M4A1

PACKAGING DRAWINGS

SPI12972700	-	Special Packaging Instructions for M4A1 Carbine

INSPECTION EQUIPMENT DRAWINGS

8440218	-	Gage, Indicator
8440219	-	Gage, Plug
8440220	-	Gage, Plug
8440920	-	Cylinder, Pressure
8443733	-	Gage, Plug, Straightness
8443915	-	Gage, Headspace (Min)
8443949	-	Gage, Headspace (Max)
8443957	-	Gage, Location
11837922	-	Gage, Indicating
11837944	-	Barrel and Bolt Proof Testing Fixture
11838443	-	Gage, Flush Pin

(Copies of other Government documents, drawings, and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated detail specifications, specification sheets, or MS standards), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained. (See contract provisions for additional precedence criteria).

3. REQUIREMENTS

3.1 First article. When specified in the contract or purchase order (see 6.2), a sample shall be subjected to first article inspection in accordance with the technical provisions herein (4.4). Unless otherwise specified (see 6.2), the first article shall include the pilot pack (see 5.1).

3.2 Materials and construction. Carbines and parts shall conform to the materials and construction requirements specified herein, on Drawing 12972700 and drawings applicable thereto, and be in accordance with the applicable materials and construction provisions of MIL-W-13855.

3.3 Design. Carbines and parts shall conform to the design specified herein, on Drawing 12972700 and drawings applicable thereto, and be in accordance with the applicable design provisions of MIL-W-13855.

3.3.1 <u>Upper receiver and lower receiver groups</u>. The upper receiver group shall be attached to the lower receiver group by the pivot pin and shall be held securely in the closed position by the takedown pin. When the takedown pin and pivot pin are withdrawn to the stop position, the upper receiver group shall disassemble from the lower receiver group.

3.3.2 <u>Lower receiver group</u>.

3.3.2.1 <u>Hammer</u>. The hammer shall pivot on the hammer pin through its full range of travel without binding, and when the hammer is released from the cocked position, it shall pivot forward to the stop position under spring action.

3.3.2.2 <u>Automatic sear</u>. The automatic sear shall be retained in the lower receiver by the automatic sear pin. The automatic sear shall move through its full range of travel under spring tension without binding, and shall engage and restrain the hammer when the fire control selector is in the "AUTO" position and the hammer is cocked by the bolt carrier. The automatic sear shall restrain the hammer until the sear is tripped by the forward motion of the bolt carrier.

3.3.2.3 <u>Fire control selector</u>. The fire control selector shall have three positions; safe, semi-automatic and automatic and shall rotate manually without binding from one position to another when the hammer is cocked. The selector shall remain in place in each position by perceptible spring detent load until manually reset and shall be retained in the lower receiver by a spring loaded detent. With the hammer cocked, when the selector is placed in the "SAFE" position, it shall prevent the trigger from releasing the hammer so that the carbine is incapable of being fired. When the selector is placed in the "SEMI-AUTOMATIC" position, it shall permit the disconnect to engage the hammer, so that the carbine is capable of semi-automatic firing only (single shot with each pull of the trigger). When the disconnect has engaged the hammer and the trigger is released, the disconnect shall release the hammer without the hammer falling. When the selector is placed in the "AUTO" position, it shall permit the automatic sear to engage the hammer, so that the carbine is capable of automatic firing (continuous firing until the trigger is released or all cartridges are expended).

3.3.2.4 <u>Bolt catch</u>. The bolt catch shall be retained on the lower receiver by the spring pin and held in the "down" position by the bolt catch plunger and spring. The bolt catch shall move through its full range of travel without binding and when positioned manually or by action of the magazine follower, it shall remain engaged and hold the bolt in the open (rearward) position. When the bolt catch is depressed the bolt shall return to battery position. When a fully loaded magazine is inserted

into the magazine well and the bolt catch is depressed, the bolt shall return to battery position, stripping a cartridge from the magazine, and chambering it.

3.3.2.5 Magazine catch and magazine release button. The magazine catch, under spring action, shall securely retain the magazine in the magazine well. The magazine release button, when depressed, shall disengage the magazine catch from the magazine and permit removal of engagement with the magazine. When the bolt is held open (rearward) by the bolt catch, and the magazine release button is depressed, the empty magazine shall be ejected under spring assist from the magazine follower being depressed by the bolt-catch. The spring tension of the magazine catch shall be adjustable by depressing the magazine release button and rotating the magazine catch clockwise to tighten; counterclockwise to loosen. The magazine release button shall be assembled to the magazine catch shaft, such that the end of the shaft is within one turn of being flush with the face of the magazine release button.

3.3.2.6 Disconnect. The disconnect shall pivot freely on the trigger pin under spring action. When the selector is in the "SEMI" position, the disconnect shall engage and restrain the hammer in the cocked position until the trigger is released. When the trigger is released, the disconnect shall allow the hammer to return to the normal cocked position.

3.3.2.7 Trigger. The trigger shall hold the hammer in the cocked position until the trigger is pulled. After partial or completed trigger pull, the trigger shall return to its normal forward positions (cocked and uncocked) under spring action.

3.3.2.8 Trigger guard. The trigger guard shall pivot on the trigger guard pin through its full range of travel. The trigger guard shall be retained in the closed position by the trigger guard spring loaded detent, and when in the open position it shall remain open against the pistol grip without manual assistance.

3.3.2.9 Pivot pin and takedown pin. The pivot pin and takedown pin shall move through their full range of travel without binding, and shall be retained in the extreme in-and-out position by spring action of the detents.

3.3.2.10 Pistol grip. The pistol grip shall be securely attached to the lower receiver and shall not interfere with operation of the selector lever.

3.3.2.11 Buttstock assembly. The buttstock assembly shall be free to slide on the lower receiver extension between the extended and retracted position. Pressure on the release lever (rear end) towards the buttstock shall withdraw the lock pin allowing movement from one position to the other. Release of the

lever when the buttstock is positioned in the extended or retracted position shall allow the lock pin to secure the buttstock in position. Pulling the rear end of the release lever away from the buttstock shall allow the buttstock to slide rearward off the lower receiver extension.

3.3.2.12 Buffer assembly. The buffer assembly shall function through its full range of travel under spring action without binding. The buffer assembly shall be securely retained in the lower receiver assembly by the spring loaded buffer retainer and be capable of being disassembled from the lower receiver assembly when the retainer is manually depressed.

3.3.2.13 Receiver extension. The lower receiver extension shall be securely fastened to the lower receiver by means of the receiver end plate being staked to the receiver extension nut. The receiver shall not rotate from its correct position with the release lever in the 6 o'clock position on the vertical centerline.

3.3.3 Upper receiver group.

3.3.3.1 Barrel assembly. The barrel shall be free of cracks, seams and other injurious defects and the bore and chamber shall be free of pockets, rings, bulges and other deformations. The chromium plating in the chamber and bore shall be free of nodules, flaking, pits, stripping, anode burns and evidence of etched base steel. Burrs and sharp edges shall be removed from chamber edges, and bolt locking lugs. Scratches or marks occurring in a chamber which otherwise meets the surface roughness requirements, shall be permitted, provided they do not cause marks on the cartridge case of high pressure test cartridge fired in the chamber.

3.3.3.1.1 Barrel assembly straightness. The barrel assembly shall be straight to the extent that a cylindrical plug with a diameter of .2173 + .0001 inches, and six (6) inches in length must drop through the barrel bore of its own weight. Also, a self aligning plug inserted three (3) inches into the barrel bore at the muzzle, shall have a maximum angular deviation from the theoretical axis of zero degrees and three minutes($0^{\circ}3'$).

3.3.3.2 Gas tube. The gas tube shall be securely retained to the front sight assembly by the gas tube spring pin. The gas tube shall be free of mutilations and positioned for proper alignment with the bolt carrier key.

3.3.3.3 Handguard. The two-piece handguard shall be held firmly in place by the handguard cap and the spring loaded slip ring in the barrel nut assembly. When the slip ring is depressed rearward the handguards shall be capable of being removed.

3.3.3.4 Front sight. The front sight shall be securely attached to the barrel assembly by two taper pins. The front sight post shall be held in position by the spring loaded front sight detent. The detent, when depressed, shall disengage the front sight post and allow vertical adjustment of the post. Clockwise rotation of the front sight post, as indicated by the arrow on the top of the front sight, shall lower the front sight post. When the carbine is zeroed as specified in 3.4.6, there shall be at least 16 additional clicks of adjustment available in a downward direction. The front sight shall provide a means for retaining and positioning a bayonet knife.

3.3.3.5 Rear sight. The rear sight shall pivot to full vertical position of both normal and short range peeps and be held in each position under spring action when at the extreme left and extreme right windage positions. The windage knob shall be held in position by the spring loaded detent. The windage knob shall be capable of rotating seven complete revolutions, moving the rear sight from the extreme left to the extreme right without binding. The rear sight shall also be capable of and calibrated for elevating, by means of an elevation knob, to compensate for trajectory for ranges from 300 meters to 600 meters. The 0-200 meter setting shall be accomplished by setting the elevation knob on 300 meters and "flipping-up" the close range rear sight peep. The rear sight shall be adjusted as specified in 3.4.6.

3.3.3.6 Ejection port cover. The ejection port cover shall operate through its full range of travel under spring action without binding. The cover shall be retained in the closed position by the cover detent, and shall open under spring action when the bolt carrier is moved from the locked position rearward, or from the open position forward.

3.3.3.7 Forward assist assembly. The forward assist assembly shall operate through its full range of travel without binding. When depressed and released, it shall return under spring action to a fully outward position with the pawl completely disengaged from the bolt carrier. Depressing and releasing the forward assist shall cause progressive movement of the bolt carrier assembly into the battery position.

3.3.3.8 Compensator. The compensator shall be fastened securely to the barrel in accordance with the applicable drawings.

3.3.3.9 Front sling swivel. The mount (sling) swivel shall be securely retained on the barrel (between the two front sight legs) by the locking bar and spring pins. The gun sling swivel shall be securely fastened to the mount swivel by the pin.

3.3.3.10 Carrying handle assembly. The carrying handle assembly shall be securely retained on the upper receiver by the two nuts and the clamp. The handle shall be capable of being disassembled from and assembled to the upper receiver by loosing and tightening of the nuts. The nuts shall rotate freely through their full range of travel without binding and shall be permanently retained on the studs.

3.3.4 Bolt carrier group.

3.3.4.1 Key and bolt carrier assembly. The bolt carrier and key assembly shall move through its full range of travel without binding in the upper receiver. The carrier key shall engage the gas tube freely when the bolt carrier moves in the forward position. The bolt carrier key screws shall be torqued and staked in accordance with the applicable drawings.

3.3.4.2 Firing pin. The firing pin shall be retained in the bolt and bolt carrier assembly by the retaining pin. The firing pin shall move freely through its full range of travel in the bolt carrier assembly. The firing pin protrusion shall be a maximum of .036 inches and a minimum .028 inches. The chromium plating of the firing pin shall be free of nodules, flaking, stripping, anode burns and evidence of etched base steel, except as specified on the applicable drawing.

3.3.4.3 Charging handle. The charging handle shall move freely through its full range of travel in the upper receiver. When the charging handle is placed in the forward position it shall engage and lock securely in the upper receiver.

3.3.4.4 Bolt assembly. The bolt assembly shall be retained in the bolt carrier by the bolt cam pin and shall move through its full range of travel. The cam pin hole shall be swaged in accordance with the applicable drawings to prevent improper assembly of the bolt cam pin in the bolt assembly.

3.3.4.4.1 Extractor. The extractor shall be retained in the bolt by the extractor pin. The extractor shall move through its full range of travel under spring action without binding in the bolt and shall be capable of engaging and extracting cartridge cases from the barrel chamber when the carbine is function fired or manually operated.

3.3.4.4.2 Ejector. The ejector shall be retained in the bolt by the ejector pin and shall be held in the forward position by the ejector spring. The ejector shall move through its full range of travel under spring action without binding in the bolt and shall eject cartridge cases completely out of the carbine when the carbine is function fired or manually operated. When fully depressed, the ejector pin shall be flush with or below the cartridge seat in the bolt.

3.3.4.4.3 Cam pin. The cam pin shall be retained in the bolt assembly by the firing pin. The cam pin shall move through its full range of travel in the bolt carrier without binding. The cam pin shall be capable of being removed from the bolt carrier without removal of the bolt carrier key assembly. The cam pin shall be capable of being disassembled from the bolt and bolt carrier assembly and reassembled 180° about its vertical axis from its original position without causing binding in the assembly.

3.4 Performance characteristics.

3.4.1 Headspace. The headspace shall not be less than 1.4646 inches nor more than 1.4706 inches when measured to the .330 inch datum diameter on the first shoulder of the chamber.

3.4.2 Firing pin indent. When the bolt is closed and the firing mechanism is released, the firing pin indent shall be not less than 0.020 inch. The firing pin indent shall not be off-center more than one half the maximum diameter of the indent. When, in a vertical, muzzle down position, the bolt carrier assembly is released from the full recoil position and the firing mechanism is not actuated, the firing pin indent shall not be more that 0.008 inch.

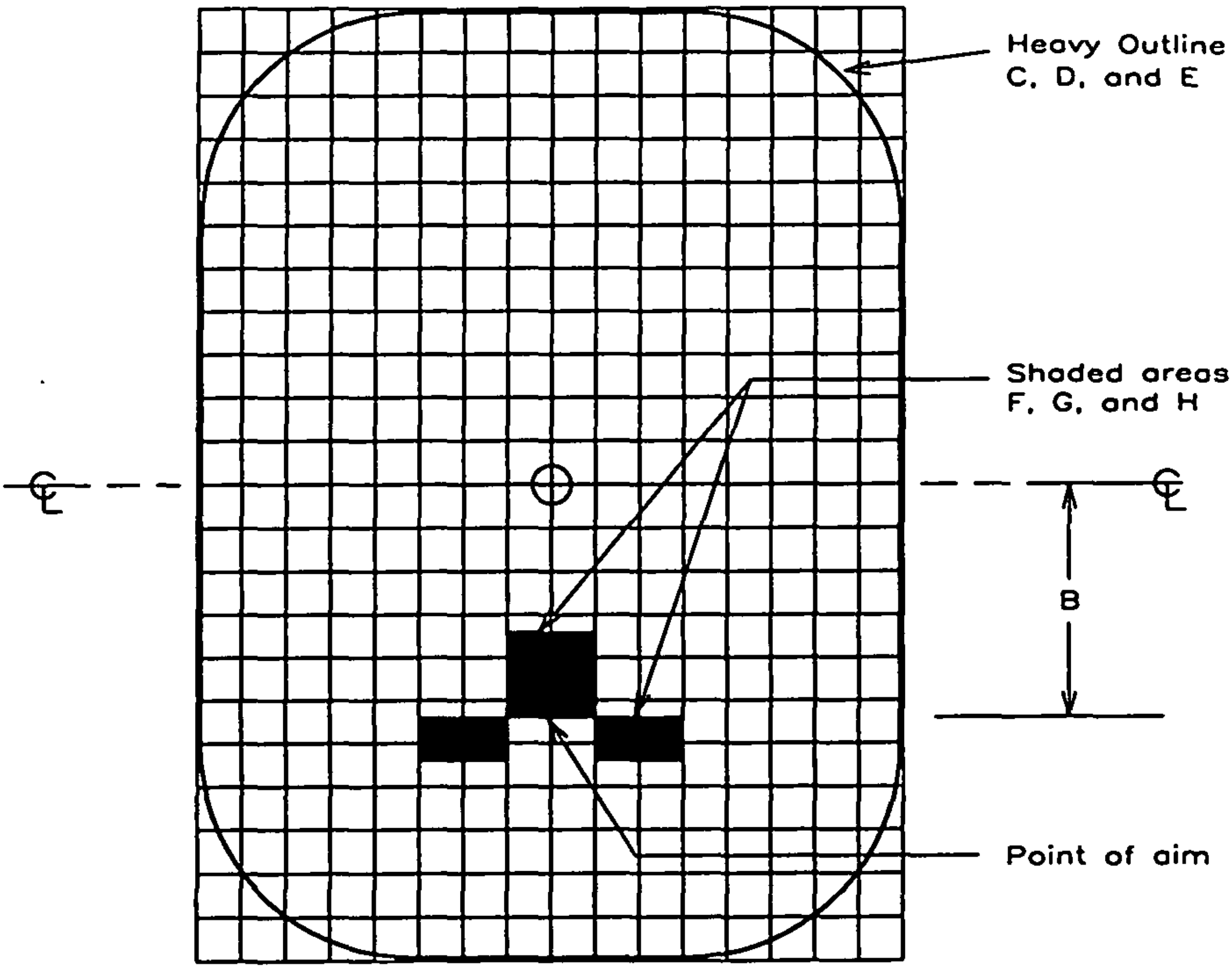
3.4.3 Trigger pull. The trigger pull shall be free of creep and shall be within the range of 5.5 to 8.5 pounds. Creep shall be interpreted to mean any perceptible rough movement between the time the trigger slack is taken up and the hammer is released. After partial or complete trigger pull, the trigger shall return to its normal forward position (cocked and uncocked) under spring action.

3.4.4 High pressure resistance. Each barrel assembly and bolt shall withstand the firing of one Government standard M197, 5.56mm high pressure test cartridge conforming to MIL-C-46936. After proof firing, parts shall be free of cracks, seams and other injurious defects as evidenced by visual and magnetic particle inspection.

3.4.5 Functioning. Each carbine shall operate without malfunctions or unserviceable parts. The cyclic rate of fire for a 30 round continuous burst using a 30 round magazine shall be within 700 to 970 rounds per minute when firing Government standard M855, 5.56mm ball cartridges conforming to MIL-C-63989.

3.4.6 Targeting and accuracy. A series of 10 rounds fired from each carbine at a range of 91.4 meters shall be within the extreme spread and targeting area (heavy outline) specified in Figure I when the front and rear sights are set as follows. The normal rear sight peep (sight rotated fully rearward) shall be used with the rear sight set centrally in the slot for windage

within plus or minus twelve (12) clicks. The top edge of the front sight post flange shall be set flush to .030 inch below the bottom surface of the front sight slot. Ammunition shall be Government standard M855, 5.56mm ball cartridges conforming to Drawing 9342868 and shall have been certified by the Government to be of a quality that will have an average horizontal and vertical standard deviation of 3.4 inches to 4.0 inches at 600 yards as measured in accordance with MIL-C-63989.



A – 10 shot group extreme spread
B – Vertical distance from target centerline to point of aim
C – Height of heavy outline
D – Width of heavy line
E – Radius of corners of heavy outline
F – Width of shaded areas
G – Height of upper shaded area
H – Heights of lower shaded areas
I – Grid dimensions

Target Diagram For		Dimensions in inches								
		Group	P.O.A.	Heavy Outline			Shaded Areas			Grid
Meters	Yards	A	B	C	D	E	F	G	H	I
91.4	100	5.0	5.2	22.0	16.0	4.8	2.0	2.0	1.0	1.0

FIGURE I. Targeting and accuracy diagram.

3.4.7 Endurance. Carbines shall be capable of withstanding the firing of 6,000 rounds for endurance with not more than the number of malfunctions and unserviceable parts allowed for both single carbine and four carbines combined as allowed in TABLE I. The cyclic rate of fire of not more than one reading on a single carbine or not more than two readings on four carbines combined, shall fall outside of 700 to 1025 rounds per minute. Ammunition used shall be Government standard M855, 5.56mm ball cartridges conforming to Drawing 9342868.

TABLE I. Malfunctions and unserviceable parts permitted in 6,000 rounds.

Malfunctions 1/	Single Carbine 7/	Four Carbines 7/
Failure of bolt to lock 2/	2	4
Failure to fire	2	4
Failure to feed (from magazine)	4	9
Failure to eject	2	4
Failure to chamber	3	7
Failure to extract	1	2
Bolts fails/hold rear	3	8
All other malfunctions 4/	0	0
Total - Above malfunctions combined	9	22

Unserviceable Parts 1/	Minimum Life 5/ Rounds	Four Carbines 6/ Combined
Ejector spring	3,000	2
Extractor spring	2,000	1
Other parts 3/	3,000	1
Total unserviceable parts - (above unserviceable parts combined)		3

1/ All malfunctions and unserviceable parts occurring during the test shall be recorded and properly identified regardless of whether they are chargeable to the carbine. Malfunctions that are traceable to components determined unserviceable after meeting minimum life round requirements may be replaced and charged against the carbine. When Government representatives have verified that previously recorded malfunctions are attributable to the unserviceable part, they shall not be counted against the carbine provided they occurred within the previous 200 rounds of firing. Malfunctions determined not to be chargeable to the carbine as a result of failure analysis shall be verified by the Government representative witnessing the test and shall not be counted (see 6.6).

2/ In the event of any failure of bolt to lock malfunction, the forward assist assembly shall be operated. Failure of the forward assist assembly to remain engaged with the bolt carrier assembly during manual attempt to lock bolt shall be considered an additional malfunction in the category of "other malfunctions".

3/ Other parts shall be limited to trigger spring, disconnect spring, hammer spring, extractor pin and extractor.

4/ Other malfunctions include, but are not limited to: occurrence of doubling (two shots fired with a single trigger pull) during semi-automatic firing; failure to immediately stop firing when the trigger is released (uncontrolled fire) during automatic firing; and failure of forward bolt assist assembly to remain engaged with bolt carrier assembly during manual attempt to lock the bolt, loosening of the nuts securing the carrying handle assembly to the upper receiver, etc.

5/ Minimum life rounds is defined as the minimum service life of an individual part, whether it is the original part or a replacement part, expressed in the number of weapon rounds fired with the part assembled in the weapon. For example, an extractor spring failing prior to firing 2,000 rounds on a new carbine, has not met the minimum life rounds. The failure shall be recorded and shall be cause for test failure.

6/ The allowable number of unserviceable parts shown for 4 carbines combined applies only to parts failing after the minimum life rounds have been fired on the weapon. For example, ejector springs failing at 3,500 rounds on one carbine, and 4,100 rounds on a second carbine, fall within the allowable limits of 2 unserviceable parts on 4 carbines combined however, failure of an ejector spring on a third carbine after firing 3,000 rounds which exceeds the allowance, shall be cause for test failure.

7/ Each individual carbine tested shall not exceed the allowable number for each malfunction in the list or the test shall have failed. When the carbine meets the individual allowable malfunctions and exceeds the cumulative total allowable malfunctions for a carbine, the test shall have failed. The combined four carbines tested shall not exceed the allowable number for each malfunction in the list or the test shall have failed. When the carbines meet the combined four carbines allowable malfunctions in the list and exceed the cumulative total allowable malfunctions for four carbines, the test shall have failed.

3.5 Interchangeability. Unless otherwise specified on the drawings, all parts shall be interchangeable.

3.6 Marking. Each carbine shall be clearly marked in accordance with the applicable drawings and MIL-W-13855.

3.7 Workmanship. Workmanship shall be in accordance with the workmanship requirements of MIL-W-13855.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of Sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 General provisions. Unless otherwise specified herein, the provisions of MIL-W-63150 apply and form a part of this specification. Reference shall be made to MIL-STD-109 to define quality assurance terms used herein.

4.3 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.4).
b. Quality conformance inspection (see 4.5).

4.4 First article inspection.

4.4.1 Submission. The contractor shall submit a first article sample as designated by the Contracting Officer (see 6.2) for evaluation in accordance with the provisions of 4.4.2. The first article shall be a representative of the production processes to be used during quantity production and shall consist of the items listed below in the quantities indicated.

NOMENCLATURE	DRAWING	QUANTITY
M4A1 Carbine	12972700	11

4.4.2 Inspections to be performed. As determined by the Government, the first article assemblies, components and test specimens shall be subjected to all of the examinations and tests specified below, and may be inspected for compliance with any or all requirements of the applicable drawings.

Test	Number To Test	Require- ment	Test Method
a. Headspace	11	3.4.1	4.7.1
b. Trigger Pull	11	3.4.2	4.7.3
c. Firing Pin Protrusion	11	3.3.4.2	4.7.2
d. High Pressure Resistance	11	3.4.3	4.7.4
e. Function/Cyclic Rate of Fire	11	3.4.4	4.7.5 - 4.5.5.3.5
f. Targeting and Accuracy	11	3.4.5	4.7.6 - 4.7.6.2.1
g. Interchangeability	10	3.5	4.7.7.1
h. Endurance	4	3.4.6	4.7.8 - 4.7.8.4.5
i. Examination	11	3.3, 3.6	4.5.2.2

4.4.3 Rejection. If any assembly, component or test specimen fails to comply with any of the applicable requirements, the first article sample shall be rejected. The Government reserves the right to terminate inspection upon any failure of an assembly, component or test specimen to comply with any of the requirements.

4.5 Quality conformance inspection.

4.5.1 Inspection lot.

4.5.1.1 Carbines.

4.5.1.1.1 Inspection lot formation. The formation and presentation of inspection lots shall be in accordance with MIL-W-13855. Lot formation shall be established after final inspection of carbines by the contractor and prior to conducting test specified in TABLE IV.

4.5.1.1.2 Lot size. Unless otherwise specified herein, an inspection lot shall consist of 1,000 carbines or a single month's production, whichever is smaller. These carbines shall be assembled from lots of component parts that have met all inspection requirements.

4.5.1.1.3 Lot identification. Each inspection lot shall be identified with a lot number. The serial number of each carbine in a lot shall be recorded on the individual carbine record. The reason for rejection of any inspection lot shall be recorded. When a rejected inspection lot is resubmitted after reconditioning, it shall be identified as such.

4.5.1.2 Parts and packaging. The formation, size and presentation of inspection lots of parts and packaging shall be in accordance with MIL-W-13855. Inspection lots shall be as large as practicable in consideration of quality history, manufacturing conditions, contractor's delivery schedule, and shall be within the limitations of MIL-W-13855.

4.5.2 Examination.

a. Classification of characteristics. Quality conformance examinations and tests are specified in the following paragraphs. The contractor's quality program or detailed inspection system shall provide assurance of compliance of all characteristics with the applicable drawing and specification requirements utilizing as a minimum the conformance criteria specified.

b. Alternative quality conformance provisions. Unless otherwise specified herein or provided for in the contract, alternative quality conformance procedures, methods or equipment, such as statistical process control, tool control, variables sampling or other types of sampling procedures, etc., may be used by the contractor when they provide, as a minimum, the level of quality assurance required by the provisions herein. Prior to applying such alternative procedures, methods or equipment, the contractor shall describe them in a written proposal submitted to the Government for evaluation (see 6.9). When required, the contractor shall demonstrate that the effectiveness of each proposed alternative is equal to or better than the specified quality assurance provision(s) herein. In case of dispute as to whether the contractor's proposed alternative(s) provide equivalent assurance, the provisions of this specification shall apply. All approved alternative provisions shall be specifically incorporated into the contractor's quality program or inspection system, as applicable.

4.5.2.1 Carbines. Final examination of carbines shall be performed by the contractor after completion of all testing of TABLE III. Unless otherwise specified herein, each carbine shall be examined for the classification of defects in 4.5.2.2. All non-conforming carbines shall be rejected and the reason for rejection recorded. The place of final examination and acceptance criteria shall be as specified in the contract (see 6.2).

4.5.2.1.1 Rejected carbines. Rejected carbines shall be corrected by the contractor and the corrective action shall be recorded. The carbines shall be reexamined for all defects listed in the applicable groups in 4.5.2.2.

4.5.2.1.1.1 Retest. When any of the following parts are replaced to correct a non-conforming carbine, the carbines shall be retested as indicated by asterisks:

		Function Firing Test	Target & Accuracy Test
1.	Barrel and Barrel Extension Assembly	*	*
2.	Gas Tube Assembly	*	
3.	Bolt Carrier Assembly - Carrier & Key	*	
4.	Bolt	*	
5.	Extractor	*	
6.	Extractor Spring Assembly	*	
7.	Ejector	*	
8.	Ejector Spring	*	
9.	Firing Pin	*	
10.	Bolt Catch	*	
11.	Bolt Catch Spring	*	
12.	Disconnect	*	
13.	Disconnect Spring	*	
14.	Hammer Assembly	*	
15.	Automatic Sear Assembly	*	
16.	Buffer Assembly	*	
17.	Action Spring	*	
18.	Safety Selector	*	
19.	Rear Sight Assembly		*
20.	Compensator and Compensator Spacer		*
21.	Upper Receiver Assembly	*	*
22.	Front Sight Post		*
23.	Carrying Handle Assembly		*

4.5.2.2 Classification of defects.

DEFECT NO.	DEFECT	INSP. METHOD	REQUIREMENT	SAMPLING PROCEDURE
MAJOR:				
	Lower Receiver, Pistol Grip, and Stock Assembly Group:			
1.	Lower Receiver. Failure of upper receiver to hinge without binding on the pivot pin when takedown pin is withdrawn to stop position.	Manual	3.3.1	100%
2.	Lower Receiver. Failure of lower receiver to readily disassemble from upper receiver when pivot pin is withdrawn to the stop position.	Manual	3.3.1	100%
3.	Pivot Pin and Takedown Pin. Failure to move throughout their full range of travel without binding and be retained in their extreme in-and-out position by the detents.	Manual	3.3.2.9	100%
4.	Automatic Sear Group. Burrs, cracks, or mutilation of hammer catch surface and bolt carrier contact for the sear.	Visual	3.7	100%
5.	Automatic Sear Group. Mutilation, distortion, or improper assembly of sear spring.	Visual	3.7 and drawing	100%
6.	Automatic Sear Group. Failure of sear group to return to rest position under spring action.	Manual	3.3.2.2	100%
7.	Hammer Group. Burrs, cracks or mutilation of trigger, disconnect and automatic sear catch surface.	Visual	3.7	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIREMENT	SAMPLING PROCEDURE
8.	Hammer Group. Burrs, cracks or mutilation of firing pin striking surface.	Visual	3.7	100%
9.	Hammer Group. Mutilation, distortion or improper seating of hammer spring.	Visual	3.7	100%
10.	Hammer Group. Improperly assembled or missing hammer pin retaining spring.	Visual	3.7	100%
11.	Trigger Group. Burrs, cracks or mutilation of hammer catch surface and safety contact surface.	Visual	3.7	100%
12.	Trigger Group. Mutilation distortion, or improper assembly of trigger spring.	Visual	3.7	100%
13.	Trigger Group. Improper functioning of disconnect due to missing or deformed disconnect spring.	Manual	3.3.2.6 and 3.7	100%
14.	Selector Group. Failure of spring loaded detent plunger to positively engage selector lever when lever is in "SAFE", "SEMI", and "AUTO" positions.	Manual	3.3.2.3	100%
15.	Selector Group. Burrs, cracks or mutilation of selector lever, disconnect and sear contact surfaces. Missing lubricant.	Visual	3.7 and Drawing	100%
16.	Bolt Catch Group. Failure of catch to pivot upward when lower button is pressed and failure of catch to return to original position under spring load when pressure of button is released.	Manual	3.3.2.4	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIRE-MENT	SAMPLING PROCEDURE
17.	Bolt Catch Group. Burrs, cracks, or mutilation of bolt contact surfaces.	Visual	3.7	100%
18.	Magazine Release Button. Improper adjustment of magazine release button.	Visual	3.3.2.5	100%
19.	Trigger Guard Assembly . Failure of trigger guard to release, pivot to stop position against pistol grip, retain this position without manual assistance, then return to its locked position and lock.	Manual	3.3.2.8	100%
20.	Pistol Grip. Insecurely attached or interferes with selector lever.	Visual and Manual	3.3.2.10	100%
21.	Buffer Retainer Group. Improper spring load action of buffer retainer or failure of retainer to retain buffer assembly.	Manual	3.3.2.12	100%
22.	Buffer Retainer Group. Burrs, cracks or mutilation of buffer retainer.	Visual	3.7	100%
	REMOVE: Buffer and Action Spring			
23.	Buffer. Burrs, cracks or mutilation of buffer.	Visual	3.7	100%
24.	Action Spring. Distortion or mutilation of action spring.	Visual	3.7	100%
25.	Pistol Grip. Missing lock washer, cracks or mutilation of pistol grip.	Visual	3.7	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIRE-MENT	SAMPLING PROCEDURE
26.	Buttstock Assembly. Cracks or mutilation of stocks.	Visual	3.7	100%
27.	Buttstock Assembly. Improper assembly of stock.	Visual and Manual	3.3.2.11	100%
	REASSEMBLE: Buffer Assembly.			
28.	Buffer Group. Failure of buffer to function throughout full range without binding.	Manual	3.3.2.12	100%
29.	Lower Receiver. Burrs, cracks or mutilation of magazine well and trigger mechanism housing area.	Visual	3.7	100%
	Upper Receiver Group.			
30.	Charging Handle Assembly. Failure of charging handle assembly to have positive latching action to upper receiver during forward travel without manual assist to latch and to require manual action to unlatch for rearward travel.	Manual	3.3.4.3	100%
31.	Charging Handle Assembly. Failure of charging handle assembly to disassemble from upper receiver without binding.	Manual	3.3.4.3	100%
32.	Charging Handle Assembly. Burrs, cracks or mutilation of latch contact surfaces, carrier key engagement surface and guide surface.	Visual	3.7	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIRE-MENT	SAMPLING PROCEDURE
	REMOVE: Bolt and Bolt Carrier Group and Inspect for Defect No. 52			
	DISASSEMBLE: Bolt Carrier Group Mark Orientation of Cam Pin			
33.	Firing Pin Retaining Pin. Burrs, cracks or mutilation.	Visual	3.7	100%
34.	Firing Pin. Burrs, cracks or mutilation of striker point.	Visual	3.7	100%
35.	Firing Pin. Pits or erosion of striker point.	Visual	3.7	100%
36.	Bolt Cam Pin. Failure to be removed from bolt carrier without binding or without removal of carrier key.	Manual	3.3.4.4.3	100%
37.	Bolt Cam Pin. Burrs, cracks or mutilations.	Visual	3.7	100%
38.	Extractor. Burrs, cracks or mutilation of extractor lips.	Visual	3.7	100%
39.	Extractor. Not properly retained by pin.	Visual	3.3.4.4.1	100%
40.	Extractor Assembly. Improper function of extractor spring assembly action.	Manual	3.3.4.4.1	100%
41.	Ejector. Improper function of ejector spring action.	Manual	3.3.4.4.2	100%
42.	Ejector. Burrs, cracks or mutilation of ejector tip.	Visual	3.7	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIREMENT	SAMPLING PROCEDURE
43.	Ejector Retaining Pin. Improper assembly. Both ends must be flush with or below bolt surfaces.	Visual	3.3.4.4.2	100%
44.	Bolt Rings. Mutilated, distorted or improperly positioned. (Ring gaps shall not be positioned in line.)	Visual	3.7	100%
45.	Bolt. Burrs, cracks or mutilation of bolt cartridge face, bearing surface, locking lugs or bolt ring slot.	Visual	3.7	100%
46.	Bolt. Pits or erosion of cartridge seat. Improper chamfer on feed lugs.	Visual	3.7	100%
47.	Bolt. Missing proof marks for magnetic particle and proof firing inspection.	Visual	3.6	100%
48.	Bolt. Missing swagged operation on cam pin hole permitting improper assembly of bolt into bolt carrier.	Manual	3.3.4.4	100%
49.	Key. Failure of key to be properly seated on bolt carrier or improper staking of bolt carrier key screws.	Visual	3.3.4.1	100%
50.	Key. Burrs, cracks or mutilation.	Visual	3.7	100%
51.	Bolt Carrier. Burrs, cracks or mutilation (Particular attention should be given to bolt cam area.) Improper serrations.	Visual	3.7	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIREMENT	SAMPLING PROCEDURE
	REASSEMBLE: Bolt and Carrier Group with Cam Pin Orientation Reversed 180°.			
52.	Firing Pin. Failure of firing pin to move freely when assembled to the bolt and bolt carrier.	Manual and Visual	3.3.4.2 and 3.3.4.4.3	100%
53.	Bolt and Bolt Carrier Group. Improper firing pin protrusion.	Gage 11837922	3.3.4.2	100%
	Upper Receiver and Barrel Assembly Group.			
54.	Handguards. Failure of handguards to disassemble and assemble or failure to be properly retained.	Manual	3.3.3.3	100%
55.	Handguards. Cracks or mutilation.	Visual	3.7	100%
56.	Compensator. Burrs, cracks or mutilation.	Visual	3.7	100%
57.	Compensator. Insecurely assembled to carbine.	Manual	3.3.3.8	100%
58.	Front Sight. Insecurely assembled to barrel.	Manual	3.3.3.4	100%
59.	Front Sling Swivel. Insecurely assembled to front sight.	Manual	3.3.3.9	100%
60.	Front Sling Swivel. Failure to pivot without binding.	Manual	3.3.3.9	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIRE-MENT	SAMPLING PROCEDURE
61.	Front Sight Post Group. Failure of front sight post to be positioned flush to not more than .030 inches below front sight flange after carbine is zeroed. Sixteen clicks of downward travel shall remain after zeroing. Rotate sight downward and return to approximate original setting. This inspection may be done during pre-function check in order not to disrupt zero setting obtained during target and accuracy test firing. (See 4.7.6.)	Gage 11838443 and Manual	3.3.3.4 and 3.4.6	100%
62.	Front Sight. Burrs or deformation.	Visual	3.7	100%
63.	Front Sight. Illegible marking. Missing MIL-L-46000.	Visual	3.6 and Drawing	100%
64.	Front Sight. Failure to meet approved functional bayonet gage.	Gage 8443957	3.3.3.4	100%
65.	Gas Tube. Failure to securely assemble gas tube so there is no relative movement between gas tube and front sight.	Manual	3.3.3.2	100%
66.	Gas Tube. Failure to align properly with carrier key.	Manual	3.3.3.2	100%
67.	Gas Tube. Mutilation.	Visual	3.3.3.2	100%
68.	Barrel Assembly. Pockets, rings, bulges or other deformations in bore or chamber. Particular attention shall be given muzzle compensator shoulder area of bore for rings or bulges.	Visual	3.3.3.1	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIREMENT	SAMPLING PROCEDURE
69.	Barrel Assembly. Burrs, cracks or mutilation of bolt locking lugs.	Visual	3.7	100%
70.	Barrel Assembly. Missing proof marks, magnetic particle stamp and chrome chamber marking.	Visual	3.6	100%
71.	Barrel Assembly. Failure of grenade launching diameter of flash suppressor to meet approved gage.	Gage	3.3 and Drawing	100%
72.	Barrel Assembly Straightness. Failure of barrel to meet approved "go" bore 6 inch drop gage.	Gage 8443733	3.3.3.1.1 and Drawing	100%
73.	Ejection Port Cover Assembly Group. Burrs or deformations.	Visual	3.7	100%
74.	Ejection Port Cover. Failure to be manually closed.	Manual	3.3.3.6	100%
75.	Ejection Port Cover Assembly Group. Improperly assembled port cover assembly spring.	Visual	3.3.3.6 and Drawing	100%
76.	Rear Sight. Failure of windage knob to rotate. Knob shall be capable of rotating seven (7) complete revolutions moving rear sight from extreme left or extreme right. (This examination may be accomplished during the prefunctional check in order not to disrupt the optimum sight setting obtained during the targeting and accuracy firing test.)	Manual	3.3.3.5	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIREMENT	SAMPLING PROCEDURE
77.	Rear Sight. Failure of rear peep sight to pivot from normal and short peeps when sight is in any horizontal position including the extreme positions. (This examination may be accomplished during the pre-functional check in order not to disrupt the optimum sight setting obtained during the targeting and accuracy firing test.)	Manual	3.3.3.5	100%
78.	Rear Sight. Improper marking on windage knob.	Visual	3.6	100%
79.	Rear Sight. Improper marking on sight.	Visual	3.6	100%
80.	Rear Sight. Failure of elevation knob to rotate from "8/3" (three hundred meter setting) to "8/3" (eight hundred meter setting). Elevation knob should not be capable of being rotated more than one (1) click below "3" (low setting).	Manual	3.3.3.5	100%
81.	Upper Receiver. Burrs, cracks or deformations.	Visual	3.7	100%
82.	Forward Assist Pawl Burrs, cracks or deformations of bolt carrier contact surfaces.	Visual	3.7	100%
83.	Forward Assist Assembly. Failure to be depressed and return to extended position under spring action without binding.	Manual	3.3.3.7	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIREMENT	SAMPLING PROCEDURE
84.	Forward Assist Pawl. Failure to be depressed and return under spring action without binding.	Manual	3.3.3.7	100%
85.	Carrying Handle Assembly. Failure to disassemble and assemble or be securely retained on upper receiver. Failure of nuts to be retained on studs.	Manual	3.3.3.10	100%
	REASSEMBLE: Carbine.			
86.	Carbine Assembly. Failure to meet headspace requirement.	Gage 8443915 & 8443949	3.4.1	100%
	Examine for defect numbers 87 through 94 by cyclic hand function of carbine using one dummy round in the magazine.			
87.	Failure of ejection port cover to open when bolt carrier is moved between rearward and forward position.	Manual	3.3.3.6	100%
88.	Failure of bolt to remain rearward when bolt catch is raised.	Manual	3.3.2.4	100%
89.	Failure of bolt to strip cartridge from magazine and feed cartridge into chamber when bolt returns to battery when magazine is inserted and bolt catch is depressed.	Manual	3.3.2.4	100%
90.	Failure of magazine to be securely retained by carbine.	Manual	3.3.2.5	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIREMENT	SAMPLING PROCEDURE
91.	Failure of bolt when charged to extract and eject dummy cartridge and cause follower of magazine to activate bolt catch to retain bolt in rear.	Manual	3.3.2.4 & 3.3.4.4.1 & 3.3.4.4.2	100%
92.	Failure of magazine to be ejected without binding, with spring assist from the bolt catch, when magazine release button is depressed.	Manual	3.3.2.5	100%
93.	Failure of bolt to be released, when bolt catch is depressed.	Manual	3.3.2.4	100%
94.	Failure of trigger return after partial or complete trigger pull.	Manual	3.4.3	100%
95.	<u>Lower Receiver</u>. Incorrect, mislocated, damaged, illegible or missing markings (serial number, manufacturer's identification, selector markings, etc.)	Visual	3.6	100%
96.	<u>Carbine Assembly</u>. Failure to meet trigger pull requirement.	Gage	3.4.3	100%
97.	<u>Carbine Assembly</u>. Fires with selector level on "SAFE". (With hammer cocked and selector lever set on "SAFE" the trigger shall not release the hammer when trigger is pulled.)	Manual	3.3.2.3	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIREMENT	SAMPLING PROCEDURE
98.	<u>Carbine Assembly</u>. With selection lever on "SEMI", fires when trigger is released. (With selector lever set on "SEMI", charge the bolt with charging handle, maintaining pressure on the trigger. When bolt enters battery position, the hammer shall not have fallen, but shall be retained in the cocked position by the disconnect. Slow release of finger pressure on trigger shall allow hammer to disengage from disconnect but not from trigger. (Slow trigger release is defined as a slow, smooth motion without hesitations or stops for at least 1 second but not more than 2 seconds to release the trigger from the fully engaged position to the completely released position.) Pulling trigger then causes hammer to fall.) This check for firing on trigger release shall be made three consecutive times.	Manual	3.3.2.3	100%
99.	<u>Carbine Assembly</u>. Failure to cycle with selector lever set on "AUTO". (1. With selector lever set on "AUTO", hold pressure on trigger and pull back and release charging handle. Hammer shall fall when bolt returns to battery position. 2. Release trigger, pull back and release charging handle. Hammer shall not fall when bolt returns to battery position. 3. Pull trigger, hammer shall fall.	Manual	3.3.2.3	100%

DEFECT NO.	DEFECT	INSP. METHOD	REQUIRE-MENT	SAMPLING PROCEDURE
100.	<u>Carbine Assembly</u>. Failure of forward assist assembly pawl to engage bolt carrier (Manual engagement of the forward assist assembly with the bolt carrier notches at any point shall prevent retraction of the bolt carrier assembly. With bolt carrier assembly retracted about one-fourth inch, as determined from the front of bolt carrier to the front of the receiver ejection port, and movably retained by the charging handle assembly, depressing and releasing of the forward assist assembly shall cause progressive movement of bolt carrier to battery position.)	Manual	3.3.3.7	100%
101.	<u>Lower Receiver Assembly</u>. Failure of the receiver extension to be properly assembled with the release lever lug oriented at 6 o'clock on the vertical centerline.	Visual	3.3.2.13	100%
102.	<u>Lower Receiver Assembly</u>. Failure of the receiver extension to be properly assembled so it will not rotate. Receiver end plate must be properly stacked into receiver extension nut.	Visual	3.3.2.13	100%

4.5.2.2.1 <u>Inspection approval stamp</u>. Carbines which have passed all examinations after successful completion of testing shall be rubber stamped by the contractor with the Department of Defense complete inspection approval stamp on the packaging list of each shipping container. The Government representative will control the stamps used for such stampings required to assure successful completion of all required examinations and tests.

4.5.2.3 Component parts and concurrent repair parts. Examination of component parts and concurrent repair parts shall be performed in accordance with the criteria as specified in the contract (see 6.2). Examination of these parts shall be accomplished prior to their assembly into the end item or submitting for acceptance as repair parts.

4.5.2.4 Packaging. Examination of packaging of carbines shall be performed in accordance with the Classification of Defects specified in 4.5.2.4.1. Sample size and acceptance criteria for each lot shall be in accordance with TABLE II, using the inspection levels stated in the Classification of Defects. A visual inspection shall be performed to assure that the criteria specified in the contract (see 6.2) result in the parts and packages meeting the acceptance criteria. Packages opened for examination shall be repackaged by the contractor at the contractor's expense (see 6.2).

TABLE II. Attributes sampling inspection.

LOT SIZE	INSPECTION LEVEL I	INSPECTION LEVEL II
2 to 8	*	*
9 to 15	*	8
16 to 25	20	8
26 to 50	20	8
51 to 90	20	8
91 to 150	20	12
151 to 280	20	19
281 to 500	47	21
501 to 1200	47	27
1201 to 3200	53	35
3200 to 10000	68	38

Numbers under inspection levels indicate sample size; asterisks indicate one hundred percent inspection. If sample size exceeds lot size, perform one hundred percent inspection. Accept on zero and reject on one or more for all inspection levels.

4.5.2.4.1 Classification of defects for packaging.

CLASSIFICATION	DEFECTS 2/	CONFORMANCE CRITERIA
Major:		LEVEL I 3/
	Interior Packaging:	
101	Illegible or incorrect marking	
102	Improper level of packaging	
103	Missing carbine components (magazine and sling)	
104	Improper cleaning and drying	
105	Improper preservative application and drainage	

106	Missing or improper protectors
107	Improper assembly of unit package
108	Improper closure boxes
109	Improper positioning of upper and lower receiver assemblies
110	Failure to unit package matching upper and lower receiver assemblies
	Exterior Container:
111	Illegible or incorrect marking
112	Improper level of packing
113	Improper closure of box
114	Improper closure and strapping of shipping containers

Minor: LEVEL II 3/

102	Workmanship

1/ Unless otherwise specified in the contract, the packaging requirements are specified on Special Packaging Instruction 12972700 as applicable.

2/ Examination for packaging defects specified above shall apply to each sample of carbines, interior packages or exterior containers as applicable.

3/ See TABLE II.

4.5.2.4.2 Repair parts. Examination of packaging of repair parts shall be performed in accordance with the criteria specified in the contract (see 6.2).

4.5.3 Testing.

4.5.3.1 Carbine Testing. Individual carbines shall be subjected to the tests specified in TABLE III. Inspection lots of carbines shall be subjected to the tests specified in TABLE IV. Sample size, acceptance criteria and test methods for each test shall be as specified in TABLE III and TABLE IV. The Government representative shall randomly select carbines to be subjected to the endurance test and interchangeability test from inspection lots that met the requirements of 4.5.2. Component parts to be subjected to the concurrent repair parts interchangeability test shall be randomly selected from accepted component inspection lots concurrently being used in the assembly of the carbines.

TABLE III. Individual carbine tests.

TEST	SAMPLE 1/	ITEM	REQUIREMENT	TEST METHOD
MAJOR:				
Headspace 4/	100%	Carbine	3.4.1	4.7.1
Trigger Pull 4/	100%	Carbine	3.4.3	4.7.3
High-Pressure Resistance	100%	Barrel Assy & Bolt	3.4.4	4.7.4
Function 2/ Cyclic rate of fire	100% 190 3/	Carbine	3.4.5	4.7.5
Targeting & Accuracy	100%	Carbine	3.4.6	4.7.6

1/ Carbines failing to meet the applicable requirement shall be rejected.

2/ Magazines may be used twice provided that excessive oil and shop dirt are removed from the magazine prior to repackaging.

3/ The cyclic rate of fire shall be taken and recorded on each carbine until 190 consecutive carbines have met the cyclic rate of fire requirement specified in 3.4.5. When 190 consecutive carbines on their initial test have met the cyclic rate of fire requirement, every 10th carbine tested for function firing requirements shall be tested for cyclic rate of fire requirement. If a carbine fails to meet the cyclic rate of fire requirement during sample testing of one of every ten, an additional sample of ten carbines shall be tested for cyclic rate. The 10 carbines tested shall meet the cyclic rate of fire specified in 3.4.5. If one or more carbines fail to meet the requirements, the contractor shall return to 100% testing of each carbine for cyclic rate of fire until qualification requirements are met prior to returning to testing one in ten carbines. However, if the cyclic rate requirements for the sample of ten carbines are met, the contractor shall continue testing every 10th carbine for cyclic rate.

4/ This test shall be conducted during the final examination specified in 4.5.2.1.

TABLE IV. Inspection lot tests.

TEST	SAMPLE 1/	SAMPLE FOR RESUBMITTED LOTS	REQUIRE-MENTS	TEST METHOD
MAJOR:				
Firing Pin Indent 2/	32	32	3.4.2	4.7.2
Interchangeability			3.5	4.7.7
Inplant				
Carbines	10 6/	20		
Repair Parts 4/	5	10		
Interplant				
Carbines 5/	5	--		
Endurance				
Carbines	4 6/	4	3.4.7	4.7.8
Magazines 3/	80 (30 Rnd)	80 (30 Rnd)		

1/ Failure of the sample, unless otherwise specified in the applicable test method, to meet the requirements shall cause rejection of the represented lot.

2/ Failure of one carbine in the sample of thirty-two to meet the requirements shall cause a second sample to be tested from the same lot. The second sample shall consist of thirty-two carbines, exclusive of the first thirty-two, (cumulative, sixty-four carbines). Failure of two or more carbines in the first sample or the combined first and second sample shall be cause for rejection of the represented lot.

3/ The 30 round magazines selected for the endurance test shall be visually and manually inspected by the contractor for workmanship and completeness of assembly and determined to be satisfactory prior to test.

4/ The sample shall be selected from each inspection lot of repair parts.

5/ When carbines are produced concurrently by more then one manufacturer, each manufacturer shall forward five carbines monthly (see 6.2) for the interplant interchangeability test. The contractor will be informed of any failure of the carbines to meet the prescribed requirements.

6/ When five successive inspection lots meet the requirements, the inspection lot size shall be increased to 5000 carbines or a month's production, whichever is smaller, and the

inspection sample selected. If rejection of the inspection sample occurs at any time, the inspection lot size of 1,000 carbines (or smaller) shall be reinstated and the above procedure repeated in returning to the 5000 carbine (or smaller) lot size.

4.5.3.2 Component parts and concurrent repair parts testing. Raw material testing, part testing, and certification shall be in accordance with the criteria specified in the contract (see 6.2). This will include chemical analysis and physical tests of materials, and tests of protective finish, heat treatment, and function of parts as applicable. The contractor shall accomplish these tests prior to assembly of component parts into the end item and acceptance as concurrent repair parts.

4.5.3.3 Packaging testing.

4.5.3.3.1 Carbines.

4.5.3.3.1.1 Materials. The contractor shall have available for review by the Government representative a statement of findings that the packaging materials conform to the applicable Special Packaging Instructions and specifications.

4.5.3.3.1.2 Determination of cleanliness testing. The contractor shall test items from each inspection lot for determination of cleanliness using the test method specified in 4.7.9.1. Sampling shall be in accordance with MIL-P-116.

4.5.3.3.2 Repair parts. Testing of packaging of repair parts shall be performed in accordance with the criteria specified in the contract (see 6.2).

4.6 Inspection equipment. The inspection equipment required to perform the inspections specified herein is identified in the "Inspection Method" column of the Classification of Defects and in the methods of inspection. Contractor inspection equipment designs shall be submitted for Government approval as specified in the contract. Designs which provide variable measurements instead of attributes data are preferred in order to facilitate the use of statistical process control. The provisions of MIL-A-70625 shall apply to all automated acceptance inspection equipment. See MIL-W-63150 and 6.7. Responsibility for acquisition, maintenance, calibration and disposition of all inspection shall be in accordance with MIL-I-45607 and MIL-STD-45662.

4.7 Methods of Inspection.

4.7.1 Headspace test. This test shall be performed during individual carbine testing in accordance with TABLE III using inspection equipment per drawings 8443915 and 8443949.

4.7.1.1 Minimum gage. The bolt shall be moved rearward to the open position. The minimum headspace gage shall be inserted in the chamber and the bolt shall be returned to the battery position. Only finger pressure shall be applied to close the bolt. To be acceptable the bolt shall fully close.

4.7.1.2 Maximum gage. The bolt shall then be retracted to the open position and the minimum headspace gage removed from the chamber. The maximum headspace gage shall be inserted in the chamber and the bolt returned to the battery position. Only finger pressure shall be used to close the bolt. To be acceptable the bolt shall not fully close.

4.7.1.3 Dimensional inspection. If the above results are in dispute, the carbine shall be disassembled and the 1.6206 + .0030 barrel dimension and the .156 - .003 bolt dimension shall be measured to determine compliance with the drawing requirements.

4.7.2 Firing Pin indent test. This test shall be performed during inspection lot testing in accordance with TABLE IV utilizing inspection equipment per drawings 8440218, 8440219, 8440220, 8440920 and Government furnished copper compression cylinders for insertion in the barrel chamber.

4.7.2.1 Firing mechanism indent. The carbine shall be held in a vertical position (muzzle down) with the muzzle end supported. The bolt shall be retracted to the rearward position and held open. A zero indicator reading shall be made on the height of the copper pressure cylinder before insertion into the chamber adapter. The chamber adapter containing the copper compression cylinder shall then be inserted in the barrel chamber. The bolt shall be manually returned to the battery position, the trigger shall be pulled to release the hammer and indent the copper compression cylinder. The chamber adapter shall be removed from the barrel chamber and the depth of the indent on the copper compression cylinder computed by measuring the distance from the original zero indicator reading to the bottom of the firing pin impression. The indent impression shall be visually examined to determine if the concentricity requirement has been met.

4.7.2.2 Bolt action indent. The bolt shall again be retracted to the open rearward position and held open. A zero indicator reading shall be made on the height of the copper compression cylinder before insertion into the chamber adapter. The chamber adapter containing the copper compression cylinder shall then be inserted in the barrel chamber. The bolt shall be returned to the battery position under spring action. The trigger shall not be pulled. The chamber adapter shall be removed from the barrel chamber and the depth of the indent in the copper compression cylinder computed by measuring the distance from the original zero indicator reading to the bottom of the firing pin impression.

4.7.2.3 Recording of data. The following data shall be recorded:

a. Carbine serial number.
b. Inspection lot number.
c. Computed measurement of firing pin indent for both firing mechanism released and not released.

4.7.3 Trigger pull test. This test shall be performed during individual carbine testing in accordance with TABLE III using Government approved inspection equipment.

4.7.3.1 Minimum load. The carbine shall be cocked and the selector lever placed in the "SEMI" position. The minimum load shall be gradually applied to the center of the trigger and exerted in line parallel to the axis of the barrel bore. To be acceptable, the hammer shall not release.

4.7.3.2 Maximum load. The carbine shall be cocked and the maximum load shall be gradually applied to the center of the trigger as before. To be acceptable, the hammer shall release.

4.7.3.3 Creep. The carbine shall also be manually tested to assure that the trigger pull is free of creep (see 3.4.3) and that the trigger returns under spring action to its normal forward position after partial or complete trigger pull.

4.7.4 High-pressure resistance test. This test shall be performed during individual carbine testing in accordance with TABLE III, using a fixture for holding the bolt and barrel assembly per drawing 11837944.

4.7.4.1 Test cartridge. One (1) high-pressure test cartridge (see 3.4.4) shall be fired in each bolt and barrel assembly. Unless otherwise specified, the bolt and barrel assembly shall be tested concurrently. After proof firing, cartridge cases shall be examined for bulges, splits, rings and other defects caused by defective chambers of the barrel assembly.

4.7.4.2 Barrel inspection. The barrel assembly shall be magnetic particle inspected in accordance with MIL-STD-1949 utilizing a current of 400 to 500 amperes for circular continuous magnetization. The barrel assembly shall be examined for evidence of cracks, seams and other injurious defects.

4.7.4.3 Bolt inspection. The bolt shall be magnetic particle inspected in accordance with MIL-STD-1949 utilizing standard five turn magnetizing coil with a current of 200 to 300 amperes. Both circular and longitudinal continuous magnetization with wet fluorescent solution shall be used. The bolts shall be examined for evidence of cracks, seams and other injurious defects.

4.7.4.4 Proof markings. Proof marks and magnetic particle inspection marks shall be applied on barrel assemblies and bolts that have passed this test.

4.7.5 Function firing test. This test shall be performed during individual carbine testing in accordance with TABLE III, and shall be accomplished with the carbines held in a Government approved firing stand simulating shoulder firing. The ammunition used on this test shall be as specified in 3.4.5, except that the ammunition used in semi-automatic firing shall be as specified in 3.4.6.

4.7.5.1 Lubrication. The carbines shall be prepared for firing using lubricant in accordance with MIL-L-63460 (CLP). Apply a light coat of oil to all surfaces of the disassembled bolt carrier group. Apply one drop of oil in each hole on the right side of the bolt carrier and in the open end of the bolt carrier key. (Do not apply excessive oil in the bolt firing pin recess.) Apply a moderate coat of oil on all firing mechanism components in lower receiver.

4.7.5.2 Pre-firing. The carbine shall be given a pre-firing examination to assure that no safety hazard exists.

4.7.5.3 Firing procedure. The selector lever of the carbine shall be set in "SAFE" position and shall be checked to assure that the carbine cannot be fired.

4.7.5.3.1 Automatic firing. The selector lever shall be set on "AUTO" for automatic firing. The carbine shall be fired using a fully loaded 30 round magazine in two (2) bursts of approximately three (3) rounds each, and the remaining rounds fired in a continuous burst. Failure of the carbine to stop firing during the interrupted burst firing upon release of the trigger shall be cause for rejection and recorded as malfunction.

4.7.5.3.2 Cyclic rate of fire. When carbines are required to be tested for cyclic rate of fire, this test shall be conducted in conjunction with the burst firing test of 4.7.5.3.1. The cyclic rate of fire measurement shall be taken on a minimum twenty (20) round continuous burst from a 30 round magazine, while the selector lever is set on "AUTO". The cyclic rate of fire shall be measured using test equipment per drawing 8443572 and shall be recorded.

4.7.5.3.3 Semi-automatic firing. The selector lever shall be set on "SEMI" for semi-automatic firing. Ten rounds shall be fired. The semi-automatic firing shall be accomplished simultaneously with the targeting and accuracy test specified in 4.7.6. During semi-automatic firing, carbines shall be checked to assure that no doubling occurs (i.e., two shots fired with a single trigger pull). Doubling shall be recorded as a malfunction and shall be cause for rejection.

4.7.5.3.4 Manual examination. Manually examine function of magazine catch and visually examine function of bolt catch in assisting magazine ejection. Depressing of magazine catch button shall cause the magazine assembly to be ejected, with spring assist from bolt catch, without binding.

4.7.5.3.5 Malfunctions. Malfunctions that are not attributable to carbines as a result of failure analysis and verified by the Government representative shall not be counted against the carbine; however, such malfunctions shall be recorded.

4.7.5.3.6 Recording of data. The following data shall be recorded:

a. Number of carbines tested and number of carbines rejected per shift.
b. Test data.
c. Ammunition lot number.
d. For each carbine that fails, record the following data:

1. Serial number.
2. Type of malfunction or failure (see 6.6).
3. Class of malfunction (see 6.6.5).
4. Round number at which failure occurred.
5. Type of firing (semi-automatic or automatic).
6. Round number of magazine at which failure occurred.
7. Type of magazine used (30 round magazine).

e. Ammunition defect

1. Carbine in which ammunition defect occurred.
2. Description of defect.

4.7.5.4 Rejected carbines.

4.7.5.4.1 Correction. Carbines rejected because of malfunction or unserviceable part during the test shall be corrected by the contractor and the corrective action shall be recorded. In the event the malfunction cause is classified as Class II or Class III (see 6.6.5), the contractor shall immediately initiate action in accordance with 4.7.5.5.2.1.

4.7.5.4.2 Retest. The carbines shall be retested by firing two (2) thirty round sequences in accordance with 4.7.5.3.1 and the cyclic rate shall be recorded. The carbine shall operate without malfunction or unserviceable parts and shall meet the cyclic rate of fire requirements.

4.7.5.4.3 Second retest. In the event the carbines fail in the retest, the procedure in 4.7.5.4.1 shall be followed. The carbines shall be retested, by firing three (3) thirty round sequences in accordance with 4.7.5.3.1 and 4.7.5.3.3 and the cyclic rate shall be recorded. Carbines shall operate without malfunction or unserviceable parts and shall meet the cyclic rate of fire requirements.

4.7.5.5 Process control criteria.

4.7.5.5.1 Process average. The process average for total carbines tested for function firing during one shift shall not exceed 2.0% defective. This process average for each shift shall be maintained and be available for Government review.

4.7.5.5.2 Failure classification. When the process average exceeds 2.0% defective during one shift, the contractor shall review the failure causes for determination of a seriousness, Class I, II or III malfunction (see 6.6.5). The contractor, in addition, shall provide the government representative with objective evidence of his determination.

4.7.5.5.2.1 Class II or III malfunction. When the malfunction cause is classified as Class II or III, the contractor shall institute corrective action in the manufacturing processes and associated quality control procedures to preclude recurrence of the cause and to assure that all carbines and components containing similar defects are purged from the prime and vendor facilities. When authorized by the Government representative, this corrective action need not include the screening of carbines previously tested for function firing. Upon completion of the preceding, the contractor shall recondition the rejected carbines and retest the carbines as specified in 4.7.5.4.2.

4.7.5.5.2.2 Class I malfunction. When the malfunction is classified as Class I or the malfunction cause cannot be determined, the contractor shall correct the rejected carbines and shall test the first eighty carbines on the following shift by firing two thirty round sequences in accordance with 4.7.5.4.2. When the number of malfunctions occurring during the test of eighty carbines exceeds one, the contractor shall continue function firing acceptance testing in accordance with 4.7.5.4.2 until corrective action has been accomplished to the applicable manufacturing process or quality assurance procedures or both, as evidenced by the testing of eighty consecutive carbines with one or less malfunctions. In the event the malfunction number is one or less during this test, normal function firing testing shall be resumed for all subsequent carbines submitted during this shift.

4.7.6 Targeting and accuracy test. This test shall be performed simultaneously with the semi-automatic firing of the function firing test (see 4.7.5.3.3) and in accordance with individual carbine test of TABLE III. A Government approved firing stand simulating shoulder firing, and targets in accordance with Figure 1 shall be used. The ammunition used in this test shall be as specified in 3.4.6.

4.7.6.1 Preparation for firing. The front and rear sights shall be set as specified in 3.4.6.

4.7.6.1.1 Warm-up shots. Except for rounds fired during function testing, firing of not more than three (3) warm-up shots off the test target shall be allowed before the carbines are tested for targeting and accuracy.

4.7.6.2 Firing procedure. The selector lever shall be set on "SEMI" and the firing sights shall be aligned on the point of aim specified in Figure 1. Ten rounds shall be fired. The target shall then be checked to determine that the targeting and accuracy requirements have been met (see 3.4.6 and Figure 1). Targets with evidence of a flyer (see 6.6.2) or keyholing (see 6.6.3) shall be cause for the contractor to repeat the test by firing a ten round complement.

4.7.6.2.1 Sight setting. The optimum sight setting obtained during the targeting and accuracy test shall be maintained on accepted carbines being prepared for shipment.

4.7.6.2.2 Recording data. The following data shall be recorded:

a. Number of carbines tested and number of carbines rejected per shift.
b Test date.
c. Ammunition lot number.
d. Extreme spread of shot group.
e. Reason for retest (flyer and keyholing).
f. For each carbine that fails, record the following:

    1. Serial number.
    2. Type of malfunction or failure (see 6.6).
    3. Type of magazine (30 round magazine).

4.7.6.3 Rejection. Carbines failing to meet the targeting and accuracy requirement shall be retested by firing a second ten (10) round target. Carbines failing to meet the targeting and accuracy requirement on the second target shall be rejected. Rejected carbines shall be corrected by the contractor and the corrective action shall be recorded.

4.7.6.3.1 Retest. Corrected carbines shall be retested by firing a ten round complement at each of two targets. The targets shall be checked to determine that both targets meet the targeting and accuracy requirements. The rate of fire will be at the contractor's option.

4.7.6.3.2 Rejection. If the retested carbine fails to meet the requirements for both targets, the carbine shall be rejected. If the carbine fails to meet only the accuracy requirements for one of the two targets, a ten round complement shall be fired at a third target. The targets shall be checked to determine that the average of the extreme spreads for the three targets meets the accuracy requirements.

4.7.6.3.3 Second retest. Carbines failing the retest shall again be corrected by the contractor and the corrective action recorded. The carbine shall then be retested by firing a ten round complement at each of three targets. The targets shall be checked to determine that the average of the extreme spreads for three targets meets the accuracy requirements. If the retested carbine fails to meet the requirements for the three targets, the carbine shall be rejected.

4.7.6.4 Process control criteria.

4.7.6.4.1 Process average. The process average for total carbines tested for targeting and accuracy on one shift shall not exceed 6.0% defective for each requirement. If 6.0% is exceeded, the first eighty carbines submitted for testing during the succeeding shift shall be tested for the requirement that exceeded the process limit, by firing a ten round complement at each two targets in accordance with 4.7.6.3.1.

4.7.6.4.2 Increased testing. When the number of failures occurring during the test of eighty carbines exceeds four for either of the requirements, the contractor shall continue targeting and accuracy testing in accordance with 4.7.6.3.1 until corrective action has been accomplished to the applicable manufacturing process and quality assurance procedures as evidenced by testing of 80 consecutive carbines as specified in 4.7.6.3.1 with four or less failures.

4.7.6.4.3 Normal testing. In the event four or less failures occur during the test of eighty carbines, the normal targeting and accuracy testing shall be resumed for all subsequent carbines submitted during the shift.

4.7.7 Interchangeability test.

4.7.7.1 Inplant.

4.7.7.1.1 Carbines. The interchangeability test shall be performed during inspection lot testing in accordance with TABLE IV. Carbines shall be tested for interchange of parts by disassembly and reassembly of parts using parts from a prearranged system specified below. Interchange of parts shall be accomplished by dividing the parts of each carbine into 10 groups of nonmating parts as shown below and distributing the groups into 10 different trays until each tray contains a complete carbine. Groups of parts from carbine number 1 shall be taken in order and placed in trays 1 through 10; groups of parts from carbine number 2 shall be taken in order and placed in trays 2 through 10 to 1; groups of parts from carbine number 3 shall be taken in order and placed in trays 3 through 10 to 2, etc. The carbines shall be reassembled using only those parts which are in the same tray. The reassembled carbines shall be tested for headspace, firing pin indent, trigger pull, function firing (including cyclic rate of fire), and accuracy tests specified in methods of inspection 4.7.1, 4.7.2, 4.7.3, 4.7.5 and 4.7.6 respectively. Disposition of interchangeability carbines shall be as specified in the contract (see 6.2).

Group I

Takedown Pin Detent (8448585) (2)
Receiver, Upper (12972670)
**Rear Sight Spring Pin (MS16562-103)
Magazine Catch Spring (8448637)
Trigger (8448592)
Front Sight Post (9349056)
Lock Washer (MS35335-61)
**Receiver Extension Nut (9290020)
Buttstock Lock Spring (9390027)

Group II

Barrel and Front Sight Assembly
Permanent assembly of:
Barrel (9390009),
Barrel Extension (9390030),
Barrel Indexing Pin (8448551),
Front Sight (9349058),
Taper Pin (8448575) (2),
Handguard Cap (9390002)
Nut Barrel (8448553)
Lower Receiver (12972652)
Extractor Pin (8448513)
Ejection Port Cover Assy (8448525)
Buttstock Lock Pin Nut (9390026)
Sling Swivel (8448571)

Group III

Receiver Extension (9390019)
Bolt (8448510) w/Bolt Rings (8448511) (3)
Ejection Port Cover Pin (8448533) & Snap Ring (MS16632-3012)
Front Sight Detent (8448573)
**Trigger Guard Pivot Pin (MS16562-129)
Trigger Spring (8448593)
Takedown Pin (8448584)
Magazine Release Button (8448636)
**Spring Pin (MS16562-121) (2)
Carrying Handle Assy (12951021)

Group IV

Key & Bolt Carrier Assy (8448505)
Takedown Detent Spring (8448586) (2)
Handguard Slip Ring (8448712)
Ejector and Safety Detent Spring (8448516) (2)
Retainer, Buffer (8448582)
Trigger and Hammer Pin (8448609) (2)
Front Sight Detent Spring (8448574)
Buttstock Release Lever (9390014)
Swivel Mount (12598617)

Group V

Buffer Retainer Spring (8448583)
Sliding Buttstock (9390013)
Ejection Port Cover Spring (8448532)
**Ejector Pin (MS16562-98)
Magazine Catch (8448638)
Disconnect (8448635)
Plunger Assy (9349085)
Rear Sight Base (12951028)
Pistol Grip Screw (AN501D-416-18)
Handguard Spring Assembly (8448555)

Group VI

Rear Sight (9349075)
Bolt Cam Pin (8448502)
Bolt Catch (8448628)
Pistol Grip (9349127)
Buffer Assy (9390023)
**Pawl Spring Pin (8448521-2)
Index Spring (9349069) (2)
Handguard Retaining Ring (MS16626-3137)
Elevation Spring (9349070)
Buttstock Lock Pin (9390025)
**Swivel Mount Pin (MS39086-41) (3)
Index Spring (12951020)

Group VII

Ejector (8448515)
Rear Sight Spring (12011987)
Gas Tube Assy (9390016)
Hammer & Hammer Pin Retainer Assy (8448612)
Compensator (9349051)
Firing Pin Retaining Pin (8448504)
Catch Plunger (8448634)
Pawl (8448543)
**Index Screw (9349065)
Swivel Mount Locking Bar (12598618)

Group VIII

Receiver Pivot Pin (8448621)
Firing Pin (8448503)
Rear Sight Windage Screw(9349076)
**Gas Tube Pin (MS16562-106)
Handguard Assy (9390003) (Top Section)
Bolt Catch Spring (8448633)
Automatic Sear Pin (8448599)
**Compensator Spacer (9349052) or Compensator Spacer (9387099) & Compensator Shim (9387098)
Pawl Detent (8448544)
Elevation Index (12951018)

Group IX

Rear Sight Windage Knob (9349077)
Charging Handle Assy (8448517)
**Bolt Catch Pin (MS16562-119)
Hammer Spring (8448611)
Fire Control Selector (9381367)
Bolt Spring (8448542)
Elevation Knob (12951019)
**Receiver End Plate (9390021)
**Buttstock Spring Pin (MS16562-202)

Group X

Extractor (8448512) w/Spring Assy (8448755)
Trigger Guard Assy (8448587)
Handguard Assy (9390003) (Bottom Section)
Automatic Sear Assy (8448595)
Action Spring (9390022)
Fire Control Selector Detent (8448631)
Plunger Spring (8448540)
Rear Sight Ball (MS19060-4808) (3)
Disconnect Spring (8448594)

Note: All items preceded by a double asterisk (**) shall be replaced during interchangeability test. Parts inadvertently damaged during interchange may be replaced without penalty when authorized and verified by the government representative witnessing the test.

4.7.7.1.2 Concurrent repair parts. The interchangeability test for concurrent repair parts shall be conducted during inspection lot test in accordance with TABLE IV. The five carbines used for the repair parts interchangeability test shall have met the test requirements of TABLE III, firing pin indent test (see 4.7.2) and the classification of defects (see 4.5.2.2.3) shall be disassembled as required and reassembled using the concurrent repair parts. No hand refinement of parts shall be permitted during interchange of parts. A function firing test (including cyclic rate of fire) specified in test method 4.7.5 shall be performed on the reassembled carbines when the following repair parts are interchanged.

Receiver, Upper (12972670)
Magazine Catch Spring (8448637)
Trigger (8448592)
Bolt (8448510), & remaining parts
Trigger Spring (8448593)
Magazine Catch (8448638)
Ejector (8448515)
Gas Tube Assy (9390016)
Bolt Catch Plunger (8448634)
Barrel & Front Sight Assy (9390007)
Extractor Pin (8448513)
Disconnect (8448635)
Buttstock, Sliding (9390013)
Lever, Release (9390014)

Compensator (9349051)
Hammer & Hammer Pin Retainer Assy (8448612)
Ejector & Safety Detent Spring (8448516)
Trigger & Hammer Pin (8448609) (2)
Spring Disconnect (9349116)
Bolt Cam Pin (8448502)
Bolt Catch (8448628)
Buffer Assembly (9390023)
Firing Pin (8448503)
Bolt Catch Spring (8448633)
Hammer Spring (8448611)
Fire Control Selector (8448630)
Key (8448506)
Extractor (8448512) w/Spring Assy (8448755)
Automatic Sear Assy (8448595)
Action Spring (9390022)
Bolt Carrier (8448507)

4.7.7.2 Interplant. The carbines subjected to interplant interchangeability test (see TABLE IV) shall be given a preliminary hand functioning to assure proper operation before parts are disassembled from the carbine. The carbines shall be tested for headspace, firing pin indent, trigger pull, functioning and accuracy requirements before and after interchange of parts, using the test methods specified in 4.7.1, 4.7.2, 4.7.3, 4.7.5 and 4.7.6 respectively. Interchange of parts shall be accomplished in a manner similar to that specified in 4.7.7.1.1. Detailed procedures for this test shall be as specified in the contract (see 6.2), depending on the number of different manufacturers involved.

4.7.7.3 Failure of interchangeability test.

4.7.7.3.1 Carbines.

4.7.7.3.1.1 Second sample. Failure of parts to reassemble during parts interchange or subsequent failure of any carbine to meet the headspace, firing pin indent, trigger pull, functioning and accuracy requirements shall be cause for selection of an additional sample of carbines from the represented inspection lot to determine the prevalence of a similar defect. The sample shall consist of 20 carbines when the lot size is 1,000 and 50 carbines when the five lot (or larger) group is represented.

4.7.7.3.1.1.1 Acceptance. If a similar defect is not found, the non-conforming carbines shall be corrected and the lot shall be accepted.

4.7.7.3.1.1.2 Rejection. If a similar defect is found, the inspection lot shall be rejected and the contractor shall examine and correct all carbines in the represented lot to insure the material containing the defects or similar defects revealed during testing are purged from the represented lot and are not presented to the Government for acceptance. The contractor shall also correct the applicable production and inspection processes and procedures to prevent the recurrence of defects revealed during the test.

4.7.7.3.1.2 Accuracy failure. Carbines failing to meet the accuracy requirements shall be corrected by the contractor to meet the requirements before they are returned to the represented lot for final acceptance.

4.7.7.3.2 Repair parts. Failure of any repair part to meet the interchangeability requirements shall cause the contractor to determine the cause of failure and inspect a sample representing the lot of parts to determine the prevalence of a similar defect. Sampling shall be in accordance with TABLE II, using Inspection Level I. Upon completion of inspection, the lot shall be reconditioned as necessary prior to submitting the lot for retesting. The contractor shall evaluate and correct the applicable production and inspection process and procedures to prevent recurrence of the defects revealed during the testing.

4.7.7.3.3 Recording of data. The following data shall be recorded:

a. Inspection lot number.
b. Carbine serial numbers.
c. All measurements required for headspace, firing pin indent, trigger pull, functioning and accuracy requirements before and after interchange of parts.
d. Cyclic rate of fire before and after interchange of parts.
e. Failure of any part to interchange.
f. Any damaged part that was replaced.

4.7.8 Endurance test. The endurance test shall be performed during inspection lot testing in accordance with TABLE IV. Carbines shall be held in a Government approved firing stand using a Government approved timing gage for measurement of cyclic rate of fire. The ammunition used for this test shall be as specified in 3.4.7.

4.7.8.1 Cleaning and lubrication. Carbines shall be cleaned and lubricated at the beginning of the test and at the end of every 10 cycles. Carbines shall be lubricated after the fifth cycle and every 10 cycle increment. No other cleaning and lubrication shall be performed during this test. At the close of each day's firing, the carbine shall be protected against corrosion.

4.7.8.1.1 Lubrication. Carbines shall have been lubricated using lubricant in accordance with MIL-L-63460 (CLP). Apply a light coat of oil to all surfaces of the disassembled bolt carrier group. (Do not apply excessive oil in the bolt firing pin recess.) Apply a moderate coat of oil on all firing mechanism components in lower receiver.

4.7.8.1.2 Cleaning. Carbines shall be cleaned with a cleaning solvent in accordance with MIL-C-372 and the following procedures:

a. Barrel. Brush bore thoroughly with a brush soaked in cleaning solvent. Brush the bore from the chamber to the muzzle using straight through strokes. Do not reverse direction of brush until it extends beyond the muzzle. Continue brushing until the bore is covered with solvent. Dry the bore by pushing clean dry swabs through the bore. Continue until the swab comes out clean and dry. Clean dry compressed air may be used for preliminary drying.

b. Barrel chamber. Insert the cleaning rod section and chamber brush that has been dipped in cleaning solvent into the chamber and use reciprocating plunge strokes and rotational 360° motions. Dry chamber with cleaning swabs.

c. Barrel extension. Using a small bristle brush that has been dipped in cleaning solvent, clean the locking lugs in the barrel extension. Remove excess cleaning solvent.

d. Bolt carrier group. With the exception of the bolt carrier key, bolt rings, extractor spring and the ejector, disassemble all parts, wash these parts in cleaning solvent and remove all carbon deposits. Particular attention should be given to the areas under the face of the extractor and behind the three rings on the bolt. Clean the bolt carrier key hole with a worn bore brush that has been dipped in cleaning solvent by rotating the brush clockwise (repeat several times until clean). Remove excess solvent and dry.

e. Upper receiver. Clean with cleaning solvent and remove all powder fouling. Clean the protruding gas tube using a bore brush attached to a section of the cleaning rod. Saturate the brush with cleaning solvent. (Do not use any type of abrasive material to clean the gas tube. Remove excess cleaning solvent.)

f. Lower receiver. Remove all carbon residue from lower receiver group assembly using cleaning solvent. Drain excess solvent from lower receiver cavity and dry.

4.7.8.2 Magazine. The twenty (20) 30 round magazines used in each carbine shall be numbered and used in rotation during this test. Magazines shall be fully loaded for each use. Each magazine used during this test shall be cleaned at the specified cleaning interval for the carbine with a cleaning solvent in accordance with MIL-C-372 and blown dry with prepared compressed air.

4.7.8.3 Measurements. The following measurements shall be made during this test:

a. Headspace. Headspace for carbines being fired with 30 round magazines shall be measured and recorded at the beginning of the test and at the completion of the 50th cycle. After the 50th cycle, the headspace shall not be more than .0028 inch greater than the initial measurement and shall not exceed .0024 inch over maximum.

b. Cyclic rate of fire. The cyclic rate of fire for carbines being fired with 30 round magazines shall be measured and recorded during the second magazine of the first cycle and the second magazine of every ninth cycle thereafter.

4.7.8.4 Firing procedure. Firing shall be accomplished in 50 cycles using 30 round magazines. One (1) firing cycle shall be as specified in TABLE V. Cooling of the barrel shall be to the point that it is capable of being held by the bare hand. Supplemental cooling is permissible in the hand guard area.

TABLE V. Firing cycle.

30 ROUND MAGAZINE	REMARKS
30 rounds	Automatic - bursts of approximately 5 rounds each.
30 rounds	Automatic - one continuous burst.
30 rounds	Semi-Automatic - rate of 10 to 30 rounds per minute.
30 rounds	Semi-Automatic - rate of 10 to 30 rounds per minute.
120 rounds - Total	

4.7.8.4.1 Unrestrained firing. During the 18th and 36th cycles for 30 round magazines, the semi-automatic firing shall be conducted outside the firing stand by firing the carbine held in the hands not touching the shoulder and without restraining the normal recoil of the carbine.

4.7.8.4.2 Failure to lock. In the event of a failure of the bolt to lock, the forward assist assembly shall be operated (see 3.3.3.7).

4.7.8.4.3 Doubling. During semi-automatic firing, carbines shall be checked to assure that no doubling occurs (i.e., two shots fired with a single trigger pull). Doubling shall be recorded as a malfunction.

4.7.8.4.4 Uncontrolled firing. During the interrupted burst firing, carbines shall be checked to assure that firing stops immediately upon trigger release (uncontrolled fire shall be recorded as a malfunction).

4.7.8.4.5 Replacement of parts. No parts shall be altered during the test. Broken parts that affect function and those parts that are worn to the extent they are unserviceable (see 6.6) shall be replaced. The contractor shall provide replacement parts as required to complete the test at no additional cost to the Government.

4.7.8.4.6 Magnetic particle inspection. Upon completion of the 6,000 round endurance test, the bolt from each carbine shall be magnetic particle inspected in accordance with 4.7.4.3.

4.7.8.4.7 Analysis. When either a malfunction occurs or a carbine fails to meet a test requirement, a failure analysis shall be performed to determine the causes. The failure analysis shall include dimensional and physical tests. Components shall not be disassembled from the carbine for inspection and test unless determined necessary.

4.7.8.4.8 Recording of data. The following data shall be recorded:

a. Inspection lot number.
b. Carbine serial numbers.
c. Each malfunction and unserviceable part (see 6.6).
    1. Carbine round at which it occurred.
    2. Carbine serial numbers.
    3. Type of firing (automatic or semi-automatic).
    4. Class of malfunction.
d. Ammunition lot number.
e. Headspace measurement.

f. Each rate of fire measurement with identification of which cycle.
g. Each ammunition defect.
h. The cause of each carbine failure.
i. If applicable, cause of test failure.
j. Type of magazine (30 round magazine).

4.7.8.5 Failure of endurance test. Failure of carbines to meet the endurance test requirements shall be cause for deferring further submission of product until the following have been accomplished and the subsequent resubmittal for endurance testing, as specified in TABLE IV, has been successfully completed.

4.7.8.5.1 Examination. The contractor shall examine the non-conforming carbines by performing a dimensional, physical, and visual examination, as required, of the carbine and magazine component that are suspected to be the cause of the test failure.

4.7.8.5.2 Retest. When the cause of the malfunction cannot be determined, the contractor shall provide the Government representative with objective evidence of the results of this analysis. Upon concurrence of the Government representative, the contractor shall retest an additional sample of four carbines for the endurance test requirements. Failure of the additional four carbines to pass endurance test requirements shall be reason for the contractor to determine failure cause. If cause of retest failure cannot be determined, technical assistance shall be requested through normal contractual channels.

4.7.8.5.3 Malfunction classification. When the cause of the malfunction can be determined, the contractor shall make a determination as to the seriousness of the cause. The contractor, in addition, shall provide the Government representative with objective evidence of his determination.

4.7.8.5.3.1 Class I malfunction. When the malfunction cause is classified as Class I (see 6.6.5), as verified by the Government representative, the Government representative shall select, from the represented lot, an additional sample in accordance with TABLE II, Inspection Level I. This sample shall then be inspected by the contractor for the carbine non-conformance determined to be the cause.

a. If the additional sample is rejected, the contractor shall examine and correct all carbines in the represented lot and institute corrective action in the manufacturing processes and associated quality control procedures to preclude recurrence of the cause and to assure that materiel containing similar defects is purged from the prime and vendor facilities. The contractor, upon completion of the preceding, shall resubmit the reconditioned lot for

endurance test as specified in TABLE IV. Carbines reconditioned by parts replacement shall be retested in accordance with TABLE III prior to resubmittal for endurance testing.

b. If the additional sample is accepted, the Government representative shall select a second sample of four carbines for the endurance test as specified in TABLE IV.

4.7.8.5.3.2 Class II or III malfunction. When malfunction cause is classified as Class II or III (see 6.6.5), the contractor shall examine and correct all carbines in the lot and institute corrective action in the manufacturing processes and associated quality control procedures to preclude recurrence of the cause and to assure that materiel containing similar defects is purged from both the prime and vendor facilities. The contractor, upon completion of the preceding, shall resubmit the reconditioned lot for the endurance test specified in TABLE IV. Carbines reconditioned by parts replacement shall be retested in accordance with 4.5.2.1.1.1 prior to resubmittal for endurance testing.

4.7.8.5.3.3 Repair parts. Upon identification of the cause of failure, acceptance of product may be resumed on those components (repair parts) which have been determined to meet contract requirements and did not contribute to the failure.

4.7.8.6 Test sample disposition. Disposition of endurance tested carbines shall be as specified in the contract (see 6.2).

4.7.9 Packaging test.

4.7.9.1 Determination of cleanliness. The applicable surfaces of each sample unit (except for barrel bores and chambers) shall be subjected to the determination of cleanliness test specified in MIL-P-116, except that the wipe test shall not be applicable to parts with black oxide or anodized protective coatings. Barrel bores and chambers shall be wipe tested for cleanliness using clean white bore cleaning swabs and the degree of cleanliness shall be verified by comparison of test swabs with standard swab samples provided by the contracting officer.

5. PACKAGING

5.1 Pilot pack. A pilot pack shall consist of complete and packed intermediate package in accordance with Special Packaging Instruction 12972700 for the level of protection specified in the contract (see 6.2) and forwarded in accordance with 3.1.

5.2 Preservation, packaging, packing and marking. Carbines with equipment shall be unit packaged, packed and marked in accordance with the requirements of the Special Packaging Instruction as applicable, for the level of protection specified (see 6.2).

5.3 Repair parts. Repair parts shall be unit packaged, packed and marked in accordance with the requirements of the applicable Special Packaging Instruction specified in the contract (see 6.2).

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The M4A1 carbine is intended for use by military personnel as a personal defense weapon.

6.2 Ordering data. Acquisition documents must specify the following:

a. Title, number and date of this specification.

b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1).

c. Lists of drawings and specifications pertinent to the carbine, showing applicable revision dates.

d. Examination and testing criteria for components (see 4.5.2.1, 4.5.2.3, 4.5.2.4.2, 4.5.3.2, 4.5.3.3.2).

e. The packages opened for examination shall be repackaged by the contractor at the contractor's expense (see 4.5.2.4).

f. Disposition of interchangeability and endurance tested carbines (see 4.7.7 and 4.7.8.6).

g. Selection of applicable levels of preservation, packaging and packing (see 5.1 and 5.2).

h. Requirements for submission of first article sample (see 3.1 and 4.4) and pilot pack, if different (see 3.1 and 5.1).

i. Packaging instructions for repair parts (see 5.3).

j. Place of final inspection and acceptance (see 4.5.2.1).

k. Lists of acceptance inspection equipment to be furnished the contractor and responsibilities for other Government property to be furnished the contractor.

l. Responsibility for furnishing ammunition (see 4.7.4, 4.7.5, 4.7.6, 4.7.8 and 6.5).

m. Shipping instructions when an interplant interchangeability test is required (see 4.7.7.2 and TABLE IV, note 6).

n. Procedures and methods for demilitarizing and disposing of rejected material.

o. Disposition of Government furnished property.

p. Responsibility for test firing facilities and operating procedures.

6.3 Test firing facilities. Test firing facilities and operating procedures shall be designed by the contractor in conformance with local, state, and Federal regulations and suitable for carrying out prescribed firing tests with safety of operating and visiting personnel. Copies of these contractor designs shall be forwarded to the contracting officer. Government facilities may be viewed upon application to the contracting officer.

6.4 Testing agency. When action by a testing agency is required, work programming will be affected with the testing agency at the earliest practical date.

6.5 Ammunition for test firing. To avoid delay in test firing, the contractor should maintain a minimum of two month's supply of ammunition as determined by anticipated firing requirements.

6.6 Definitions.

6.6.1 Malfunctions.

a. Failure of bolt to lock. Failure of bolt to fully close and rotate to the locked position in the barrel extension.

b. Failure of the forward assist assembly to assist bolt closure. Failure of the pawl of the forward assist assembly to engage or remain engaged with the bolt carrier serrations during manual attempt to lock the bolt, when the bolt fails to lock on return to the battery position.

c. Failure to fire. Failure of the carbine to fire the cartridge, when the cartridge has been fully chambered, bolt has been locked in the battery position, and the trigger has been pulled.

d. Failure to feed from magazine. Failure of the bolt to completely strip the next round from the magazine.

e. Failure to eject. Failure of the carbine to eject a round from the carbine, when the cartridge has been fired and the cartridge case has been completely extracted from the magazine.

f. Failure to chamber. Failure of the carbine to chamber a cartridge that has been completely stripped from the magazine.

g. Failure to extract. Failure of the carbine to remove a cartridge case or unfired cartridge from the chamber.

h. Bolt fails to hold to the rear. Failure of the bolt to remain in the rearward position after the last round in the magazine has been fired.

6.6.2 Flyer. A flyer is defined as a shot hole which is a greater distance from the nearest shot hole than the extreme spread of the other nine holes (including the shot hole nearest the flyer).

6.6.3 Keyholing. Keyholing is defined as any shot hole on the target that is not circular.

6.6.4 Unserviceable part. An unserviceable part is one that causes malfunction of the carbine or impairs the safety of the user. Parts which are worn, broken, deformed, cracked or contain defects to the extent that they may affect function or safety in operation of the carbine shall also be considered unserviceable.

6.6.5 Class of malfunction.

Class I. Immediately clearable (clearable by gunner through operation of charging handle, removal of magazine or manually removing round without aid of tools or equipment).

Class II. Clearable by gunner with available equipment. (Basic Issue Items).

Class III. Not clearable by gunner.

6.6.6 Defective carbine. A defective carbine is a unit of product which contains one or more defects (end item assembly or component).

6.7 Submission of contractor inspection equipment designs for approval. Submit copies of designs as required to: Commander, U.S. Army ARDEC, ATTN: SMCAR-QAF-I, Picatinny Arsenal, NJ 07806-5000. This address will be specified on the Contract Data Requirements List, DD Form 1423 in the contract.

6.8 Drawings. Drawings listed in Section 2 of this specification under the heading U.S. Army Armament Research, Development and Engineering Center may also include drawings prepared by, and identified as Rock Island Arsenal, Frankford Arsenal, Picatinny Arsenal or ARRADCOM drawings. Technical data originally prepared by these activities is now under the cognizance of ARDEC.

6.9 Submission of alternative quality conformance provisions. All contractor proposed alternative quality conformance provisions will be submitted to the Government for evaluation/approval as directed by the contracting activity.

6.10 Subject term (key-word) listing.

Gun
Small arms
Weapon
Quality assurance
Accuracy

Custodian:
Army-AR

Preparing activity:
Army-AR

(Project 1005-A822)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER: MIL-C-71186(AR)

2. DOCUMENT DATE (YYMMDD): 31 January 1994

3. DOCUMENT TITLE: CARBINE, 5.56MM: M4A1

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets if needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)

b. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (Include Area Code)
(1) Commercial
(2) AUTOVON (If applicable)

7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME: US Army, ARDEC

b. TELEPHONE (Include Area Code)
(1) Commercial: 201 724-6626
(2) AUTOVON: DSN 880-6626

c. ADDRESS (Include Zip Code)
SMCAR-BAC-S
Picatinny Arsenal, NJ 07806-5000

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:
Defense Quality and Standardization Office
5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466
Telephone (703) 756-2340 AUTOVON 289-2340

DD Form 1426, OCT 89 *Previous editions are obsolete.* 198/290